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WITH SUGGESTED TREATMENT.

A Paper read before the Grant County Medical Society, at Williamstown, Ky., June 15, 1893,

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All who consider disease an entity must endeavor to explain its causation by means of special agencies. Such has been the history of medicine in the past, and it is the same to-day; but there is at present also a tendency among a few toward generalization. To this end I have been working for the last three years. The material is almost sufficient, the age almost ripe, for those generalizations in physiology which will certainly lead to the discovery of laws. With the aid of these laws we can understand disease and know the cause. These laws must be supported by the great mass of pathological facts. When skilled microscopists study more carefully, and improve their means of investigation, the biology of the cell will be better understood, and its ultimate construction and the changes which it undergoes be made plain, as well as how these changes are influenced. Our knowledge of life must discover these laws; these laws must explain those aberrations of life we call *disease*.

This explanation of my views is a necessary preface to our investigation of the etiology of the disease under consideration. As an aid to our study of the etiology of cholera, we present a brief review of its history. It would be profitable, no doubt, to note the many theories of the past, when disease of every description was viewed in a mysterious light—thought to be caused by the visitation of evil spirits, the person was possessed by devils, or else it was

caused by the wrath of the gods. This conception of the etiology of the disease at once suggested the *treatment*. The evil spirits were to be frightened away and the gods appeased by priestly sacrifice. So at the present time our treatment of disease is largely influenced by the accepted explanation of its causation. Hence the importance, at this time, of carefully considering the etiology of cholera, so that we may be able to form better plans of treatment.

The history of its origin shows it to be like other diseases. It is generally supposed to have originated in the far East. In certain parts of India, in a soil prepared for its growth, it sprang up *de novo*, and, nourished by this rich soil, warmed by a tropical sun, it sank its roots deep, and became forever a fertile source to supply the world with its death-dealing progeny.

The history of the origin of any disease, seriously looked into by scientific minds, shows a grouping of conditions. Those conditions are not found all over the surface of the earth. As the existence of these conditions is limited, so is the prevalence of certain diseases. The effect these conditions have on the individual man must be most potent for evil where they meet with the least resistance. The resistance of the individual man must depend on his antecedents. Processes operating by physical laws on matter may be diverted, but the laws of life cannot be changed. Hence the processes in disease can only differ

from the normal in form and course. Therefore the diversion of these processes must depend on the antecedents and surroundings of the individual.

Now we note the conditions of the individual and his surroundings in that part of India where cholera prevails as an endemic. The climate is tropical; an abundance of organic matter is present, undergoing disintegration, forming new compounds, etc. Drinking-water, food and air are contaminated by these things. The individual is in keeping with the surroundings—unclean. To this add vicious habits and excesses, of a kind enervating and depressing; deficient food, perhaps more often in quality than quantity; changes in the atmosphere, sudden and detrimental. Under these conditions we should expect those aberrations known as disease, monstrosities, degenerations, and the various clinical phenomena. Antecedents would necessarily be a lowered vitality, instability of tissues, and other evidences of malnutrition. Of course, the “higher” tissues of the body, where those complex changes and complex results are taking place, must needs be faulty. The environment of the individual must always play a more or less important part in directing the antecedent tendencies.

We have noted the conditions of the earth's surface where cholera is *markedly* endemic, in regard to organic matter and the inhabitants there. We note the depressing influence of vice and vicious surroundings. It is also within the tropics, where the tendency is to diarrhœa, dysentery, violent electrical disturbances, etc. As for the atmosphere, we can no longer consider it a combination of oxygen, nitrogen with carbon dioxide, and traces of ammonia. We know now that it contains besides subtle substances and forces which at present we are unable to grasp, as electricity, light and gravitation, which substances show evidence of many variations, and of course must have a powerful effect on man as well as his surroundings.

It has been said—and well said, too—that if man could keep in perfect harmony with his surroundings he would

live forever. As it is he falls short of this by reason of his imperfect knowledge and antecedents. However, he is improving, must improve, and will eventually reach the goal of his existence and live forever. All matter is subject to the physical laws of the universe, and man is not an exception. Whenever he violates these laws he must suffer the penalty, and only the fittest survive. We know that life must be preceded by life, and effect by cause. These are laws. We have drawn a synopsis of life, with its possibilities, and shown how the results are most numerous where the cause is most active. This is a crucial test of the cause, and if properly supported by pathological data must prove the cause of the conditions in question.

Under certain conditions, named above, man, with his antecedents, in portions of India, must have and does originate a process which produces a condition known as cholera. This process and condition must be according to the laws referred to, wherever and whenever the necessary antecedents and conditions exist. If these antecedents referred to exist only in a certain portion of India, then cholera is endemic there; if over a larger area, and operates on many subjects, it is called epidemic; if still larger the area, and more numerous the subjects, it is called a pandemic.

A sufficient aberration in man and his environment may take place to produce cholera in other places besides India—in fact, any place where those conditions are present that produce the processes which result in the effect, cholera. When these conditions are isolated we call the results sporadic cholera, cholera nostra, etc.; but there is no difference save one of degree. The same individual, in an epidemic, subjected to further depressing forces, as fear of the disease, would show all the intensity of the most malignant form, and be called by competent judges true Asiatic cholera. When the necessary conditions are prevalent over a large territory we find every degree of intensity, from the most malignant to the mild cholerine.



There are some reasons for rejecting the now prevalent dogma that disease in general is a *specific something*, and more especially that cholera is a specific disease, due to a specific germ. Hospitals for its treatment are not foci of infection. Patients with the disease, taken beyond the *epidemic's influence*, do not become foci of infection. Physicians, nurses and others, who are necessarily exposed more than persons who are not thus directly brought into contact, show no increased disposition to have the disease. Efforts to inoculate or otherwise produce the disease in a healthy individual, by every known means, have been failures. The mortality of the disease has been little affected by any known method of treatment. Cholera follows well-known routes of travel, simply because those conditions which produce the disease are most numerous and active where man is most numerous and regardless of the laws of health and life. It does not present an unbroken march; when an epidemic begins in a country or city the first cases are frequently isolated ones, having not the slightest connection, and occurring simultaneously.

Every epidemic no doubt presents complex conditions that complicate the problem, and make it difficult to explain all the phenomena present or furnish data for the support of any theory; but should we be able to isolate a case, proven beyond a reasonable doubt to be like those cases complicated in every essential particular, the solution of this simple problem would give us a key to solve the complex. In the last epidemic of cholera I find such a crucial case—proven to be a genuine case of cholera by a physician who treated as many cases as he was able to see, and who also had the clinical advantage of seeing cases in Cincinnati. He pronounced this case true Asiatic cholera. It was in the country, without a single possible chance of connection with any other case. All that was eaten, drank, worn or touched for a month previous to the attack was obtained on the farm, and no one had been there who had the disease, or even been where any one else had it. By every law of reason and

analogy this would exclude infection and contagion. If that case of cholera was due to a germ, and it must have been, according to the germes, it sprang up *de novo* from the place. If they insist on cholera, and other diseases as well, being *caused by specific foreign germs*, they may with equal reason and truth insist on *spontaneous generation*, which no scientist will for a moment admit in this enlightened age. I have no doubt that the so-called comma bacillus of Koch, the cholera spirillum, was present in this case—as a result, however, of the process, which was due to the conditions referred to before, and the primary cause of cholera. It need not have been present, however, as it does not produce the disease—is not the cause.

The theory that cholera was a specific disease, and due to a specific microbe, had its origin in the past. Based on the pathological conception that it was a disease exclusively of the alimentary canal, it naturally followed that the specific agency must be introduced into the canal from without the body. It must be a foreign substance or something, for if always in the canal, and it was the *cause of cholera*, it must *always produce the disease*. This *something* was called a virus. This view has been changed and enlarged, but the conception of its pathology has materially remained the same. It was next taught that fermentation and decomposition were necessary to produce an active virus. Then that the excreta contained germs which, under favorable conditions of soil, atmosphere, etc., became active. Pacinni, in 1855 I believe, was the first to maintain that cholera was due to micro-organisms, which he called vibriones. Few at that time believed the view at all tenable. The profession was losing faith, however, in the older theories, and were ready for anything offering a hope of light. This they hoped to receive in the new theory supported by the discovery of the comma bacillus of Koch. Now the pendulum of scientific progress was pushed vigorously forward by many ambitious *savants*, every one of whom had only one idea, to *outrun the others*



in the same direction, and they rushed pell-mell after the leaders.

So from the mysterious something, as evil spirits, to miasms, virus, vibriones and comma bacillus is only a short distance over a well-graded road. Many of these views are only known as curiosities of the past, representing periods in the slow development of the human intellect and its resulting discoveries. These theories were no doubt advanced for the age which produced them, but to-day we are not satisfied with them, if not absolute skeptics. Judging the future by the past, the present theory cannot last long, for it is based on no established truth, physiological or pathological, without which no true advancement can be hoped for. No true advancement has ever been the popular creed of the age which produced it.

What is cholera? It is a condition of the economy giving rise to processes which are like the normal processes, differing in form and course, however, and detrimental to the welfare of the organism involved. It is not confined to the alimentary canal, nor are the lesions found there sufficient to explain the phenomena of the disease. In the language of Flint, "It is fair to infer that the primary essential change is not in the solid structures of the alimentary canal, from the rapidity with which recovery takes place when the disease is promptly arrested." These processes do produce lesions in the alimentary canal, which we will note at this time. Loss of epithelium, congestion and hyperplasia is more or less marked. The spleen and liver, as well as the general tissues of the body, undergo changes. The kidneys, next to the small intestines, show the most marked changes. Even when death occurs in twelve to sixteen hours from the beginning of the attack, there is proliferation of epithelium lining the uriniferous tubules, cloudy swelling, and may be fatty degeneration. There is an exsanguinated condition of some organs, and a notable loss of watery constituents from the organism. The phenomena produced by this process and resulting lesions are as follows: Diarrhœa, pro-

fuse watery discharges, with flakes of epithelium; vomiting, cramps, collapse and death.

What is the cause of the cholera process? *Not any known micro-organism*, to be sure, for this process *must always precede* the comma bacillus of Koch, which is the only admitted microbe that enters into the etiology of cholera. I say it must, advisedly, for several reasons. In the first place, it is proven by experiment that these micro-organisms must have a *certain kind* of soil to live and thrive—some best in one, some in another. That soil must be prepared, for it is not found in the healthy human organism. Those micro-organisms that do grow in the soil of a healthy person are proven to be non-pathogenic; whether a foreign body, or a part of the organism, is not proven as yet, but the burden of proof is in favor of the latter view. That some microbes do become factors and produce certain phenomena in the pathological condition—disease—is evident; but it is begging the question to say that these microbes are the *primary essential cause* of this condition. To sustain the proposition that pathogenic microbes do live and thrive in a perfectly normal, healthy organism; that in such an organism they do find a suitable medium for life and growth, would, like the present basis on which the theory rests, prove fatal to the theory itself. Clinical history would in either case furnish insurmountable barriers. Immunity, according to the theory, is an example operating in the first case, and a like barrier to the received theory is the fact that if a suitable medium is not found in the healthy organism the microbes cannot produce that medium, for if they did immunity does not exist, and if they do not they are not the essential primary cause of any pathological condition or disease. If not the cause, and if present, they must have been a part of the organism in the same form, or in a different form, or else they are foreign bodies. If foreign bodies, their presence, coincidental with the process producing this medium, is the merest accident, or else, by the economical laws of nature, they are present



to perform the beneficial office of scavengers.

This general view of the germ theory is applicable to the special germ theory forming so important a part of the literature on the etiology of cholera. The comma bacillus of Koch is the admitted cause of Asiatic cholera by those who accept that theory. I reject the theory, and deny that the comma bacillus is the primary essential cause of cholera. My reasons for doing so are in part stated above, supported by the fact that the known history of the life of the comma bacillus is inconsistent with the known clinical history of cholera, and far from sufficient to explain its phenomena.

What, then, is the primary essential cause of cholera? With the present light, I believe it to be a condition of the economy brought about by a combination of influences and acted upon by physiological forces, producing a series of phenomena and lesions known as the cholera process. This process differs from the normal processes only in form and course. The influences referred to are usually spoken of as predisposing causes, but in reality are the *essential cause*. Malnutrition, in its multitude of forms, embraces this cause. Various agencies combine to produce this result. Insufficient food, in quality or quantity; bad hygienic surroundings; temperature at which organic matter most readily decomposes, setting free foul gases, etc.; fear, which places the nervous system in an unstable attitude in regard to its surroundings—tension is high, nervous food scarce. In this condition the electrical forces under which the organism normally lives, even if they have undergone no unusual change—but there are reasons to believe they have—find a body peculiarly susceptible to such influence. The normal osmosis disturbed, there is no longer normal transfusion between living cells. The exosmotic current predominates, and finally drains the organism of its liquids. The vital phenomena can no longer operate, and death closes the scene. It is a notorious historical fact that famine is always, as a rule, followed by pestilence. These things are sup-

ported by pathological data and clinical history. The absence of a single condition or phenomenon does not prove the absence of the disease under consideration.

Our object in studying disease is to prove our treatment. Treatment of cholera may be considered under the two general heads, preventative and curative.

The preventative treatment of any disease, more especially of cholera, is the most important, reliable and successful, and consequently the safest. How are we to prevent cholera? Avoid known causes, mentioned above; nourish the body as perfectly as possible; observe the laws of health scrupulously; secure personal and surrounding cleanliness; avoid all excesses, either eating, drinking, working, or sexual excess; drink pure water and eat pure food; live regularly and naturally; stay in the open air and avoid excessive heat of the sun; dress comfortably, coolly, but so as to avoid sudden chilling of the body; if weak build up the strength, if strong endeavor to stay so; trust in your own strength and do not be frightened.

As to curative treatment: Begin with the earliest departure from health. Use sulphuric acid, with aromatics and anodynes, as opium, calomel and salol, in appropriate cases. If in collapse, or tendency to collapse, use warm general bath; bury the patient in the water. Place in the water a sufficient amount of sodium chloride, phosphate and potassium carbonate to make a weak alkaline-saline solution, of about the same density as the blood. Then, in suitable cases, whenever the collapse is severe, the exosmosis excessive and persistent, resort without delay to cataphoresis. Pass the fluid directly into the tissues, change polarity of cells, etc.







